SUPERFUND

SITE UPDATE

Pike Hill Copper Mine Site
Corinth, VT

U.S. EPA | HAZARDOUS WASTE PROGRAM AT EPA NEW ENGLAND

THE SUPERFUND PROGRAM protects human health and the environment by investigating and cleaning up often-abandoned hazardous waste sites and engaging communities throughout the process. Many of these sites are complex and need long-term cleanup actions. Those responsible for contamination are held liable for cleanup costs. EPA strives to return previously contaminated land and groundwater to productive use.

INTRODUCTION

The United States Environmental Protection Agency (EPA) is proposing to implement a cleanup action to address the ongoing release of contaminated water from the Pike Hill Copper Mine site into Pike Hill Brook and Cookville Brook Tributary #4. The reasons for the cleanup along with the cleanup alternatives considered are summarized in this fact sheet and documented in a report, called an Engineering Evaluation/Cost Analysis (EE/CA). *The EE/CA is being released for public comment. EPA wants to hear your opinion on these options. Comments from the community will be accepted from August 3, 2022 to September 2, 2022. EPA is also requesting public comment regarding impacts to on-site wetlands/waterways, downstream floodplains and historic resources at the Site. See page 7 for information about how to submit a comment.*

Public Hearing for the Engineering Evaluation/Cost Analysis
Corinth Town Office - August 23, 2022 at 7:00pm
1387 Cookeville Road, Corinth, VT 05039

WHY CLEANUP IS NEEDED AT THIS SITE?

Historic mining operations at Site have left behind sulfide-containing waste rock and mine tailings that are releasing low-pH (acidic) contaminated water (known as mining-influenced water or MIW) with elevated levels of metals that is highly toxic to many aquatic organisms. This release is causing the following impacts:

- The fish and benthic organisms (aquatic bugs) in Pike Hill Brook are significantly depleted for about 1.5 miles below the Site and do not fully recover to reference (or unimpacted) levels for the remaining 2.5 miles of Pike Hill Brook, with a total length of fish and benthic impacts of 4 miles. Cookville Brook Tributary #4 below the Smith Mine is impaired for 0.7 miles.

continued >

KEY CONTACTS

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1-888-EPA-7341

LEARN MORE AT
www.epa.gov/superfund/pikehill

WHY CLEANUP IS NEEDED AT THIS SITE? *continued*

- The concentration of copper being released from the Site exceeds federal and state water quality standards designed to protect aquatic biota (i.e., fish and other aquatic life) in both Pike Hill Brook and Cookville Brook Tributary #4.
- The contaminated water for the stretch of Pike Hill Brook from the Site extending 0.5 miles downstream of the Site killed 100% of the fish exposed to this water in laboratory tests. Only 15% of the fish survived when exposed to water from a location 1.5 miles downstream of the Site. For comparison, 95% of the fish survived when exposed to water in Pike Hill Brook downstream of the wetland and in an unimpacted tributary of Pike Hill Brook. Toxicity tests were not performed for the water in Cookville Brook Tributary #4.

The Vermont Department of Environmental Conservation (VTDEC) has identified the entire 4-mile reach of Pike Hill Brook from the Site to the Waits River and the 0.7-mile reach of Cookville Brook Tributary #4 downstream of the Smith Mine as impaired in the 2020 303(d) list of impaired waters, which was approved by EPA Region 1 on September 17, 2020. Figure 1 shows the location of the Pike Hill Copper Mine Superfund Site along with the extent of the impairment in Pike Hill Brook and Cookville Brook Tributary #4.

Figure 1 shows the extent of the impairment in Pike Hill Brook itself and Cookville Brook Tributary #4 and the loca-tion of the Pike Hill Copper Mine Superfund Site

CLEANUP ALTERNATIVES EVALUATED IN THE EE/C A

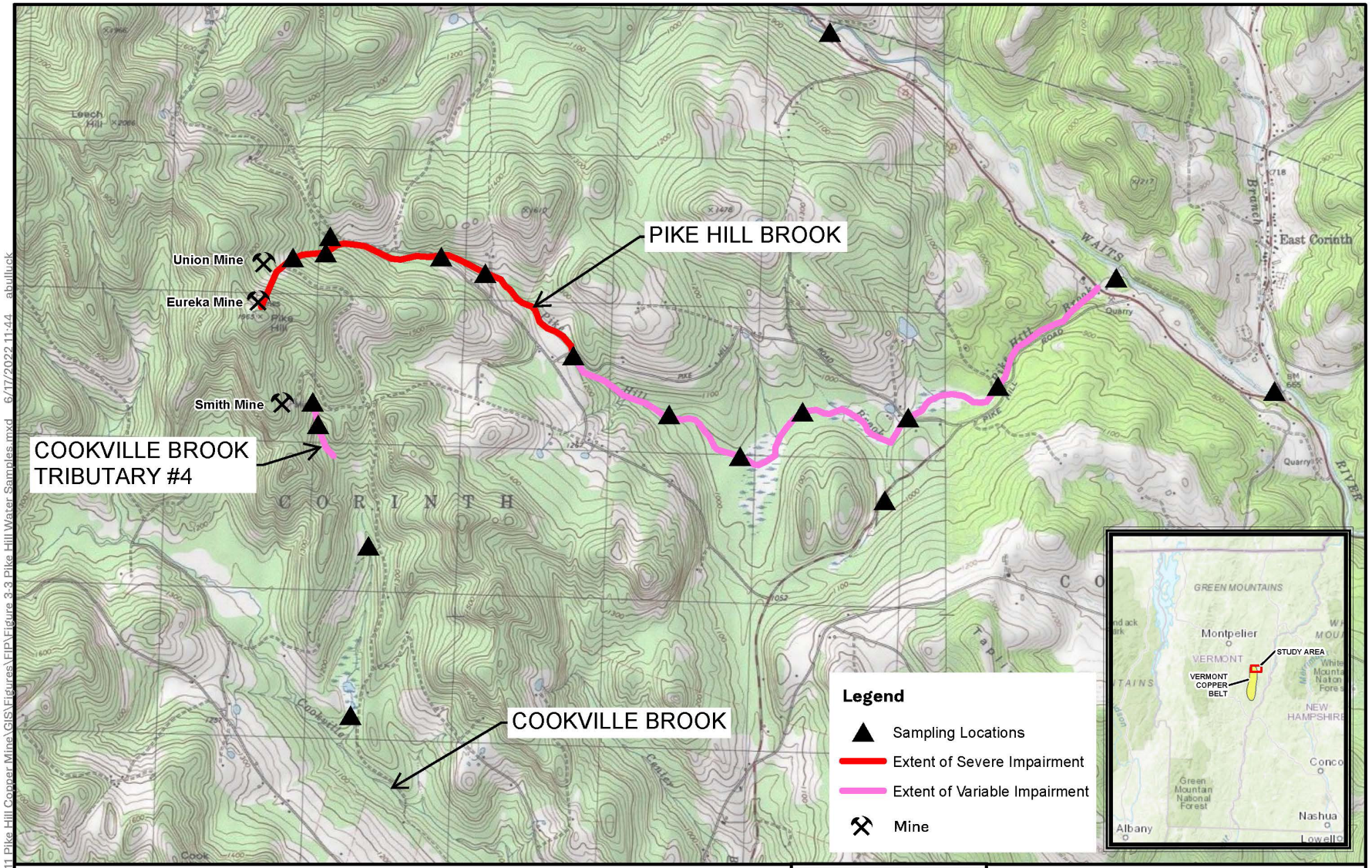
Two cleanup alternatives were evaluated in the EE/CA:

Alternative 1: Excavation and on-site consolidation/capping of mine waste with in-situ stabilization of select areas of mine waste.

Alternative 2: Excavation and off-site disposal of mine waste with in-situ stabilization of select areas of mine waste. Non-Time Critical Removal Action (NTCRA)

NON-TIME CRITICAL REMOVAL ACTION (NTCRA)

EPA is using its authority to perform a type of clean-up, called a Non-Time Critical Removal Action (NTCRA), to advance the clean-up at the Site substantially at this time. The use of a NTCRA is authorized under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (popularly known as "Superfund") and regulations issued under the statute entitled the National Contingency Plan (NCP). Accordingly, on December 1, 2021, EPA issued an Approval Memorandum to commence this EE/CA, which identifies and evaluates alternative and recommends the cleanup approach to be implemented in the NTCRA. The EE/CA evaluated the alternatives listed in the sections below using three criteria (effectiveness, implementability, and cost) to identify the recommended alternative. The NTCRA is expected to be a complimentary part of the overall comprehensive remedial action (site cleanup) and the alternatives considered here are all consistent with and would not conflict with any reasonably anticipated remedial action at the Site.



Notes:

1. This figure was developed from information found within the "USGS Surface-Water Hydrology and Quality at the Pike Hill Superfund Site, Corinth, Vermont, October 2004 to December 2005 Scientific Investigations Report 2007-5003."

2. Base from US Geological Survey, West Topsham, 1981 and East Corinth, 1973.

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FIGURE 1

SITE LOCATION AND EXTENT OF STREAM IMPAIRMENT
PIKE HILL COPPER MINE
SUPERFUND SITE
CORINTH, VERMONT

PREPARED BY: ATB	CHECKED BY: BJK
PROJECT NO. 80111	DATE: JUNE 2022

F:\80000 Task Orders\80111 Pike Hill Copper Mine\GIS\Figures\FIP\Figure 3-3 Pike Hill Water Samples.mxd 6/17/2022 11:44 abulluck

Removal Action Objectives

The EE/CA identified the Removal Action Objectives for the NTCRA, which are listed below:

- Control/reduce the release of MIW from mine waste to improve the composition and density of the aquatic community and reduce toxicity to the biota in Pike Hill Brook, Cookville Brook Tributary #4, and associated wetlands.
- Control/reduce the release of MIW from mine waste to reduce the loading of copper into Pike Hill Brook and Cookville Brook Tributary #4 and to lessen the area exceeding surface water quality standards.
- Control the erosion of mine waste into Pike Hill Brook to reduce the transport of contaminants into Pike Hill Brook, reduce toxicity to biota, and improve the composition and density of the aquatic community in Pike Hill Brook.
- Implement the response action in a manner that will minimize, to the extent practicable, impacts to federal and state threatened and endangered bats.
- Implement the response action in a manner that will minimize, to the extent practicable, impacts to historic resources at the Site.

Alternative 1: Excavation and on-site consolidation/capping of mine waste with in-situ stabilization of select areas of mine waste (EPA's Recommended Alternative)

Alternative 1 includes two methods to address the release of contaminated water from the Site:

(1) The majority of the mine waste (approximately 64,500 cubic yards) will be excavated and consolidated into an engineered waste containment cell (or multiple cells) The waste containment cell cover system will include an infiltration barrier (geomembrane) that will be covered by sufficient material to protect the barrier layer and promote run-off. The top layer of the cover system can be vegetated or stone armored. Specific details of the waste cell and cover system will be determined during the NTCRA Design.

(2) For areas of the Site that are close to historic resources (foundations/features) or the mine openings that provide important habitat for threatened and endangered bats, the mine waste (approximately 20,500 cubic yards) may be managed in place by placing a soil cover with treatment additives over the mine waste to limit the release of MIW. The soil amendments could include lime and/or organic material to promote healthy vegetation.

Alternative 1 also includes:

- Construction of surface water diversion channels; restoration of disturbed areas outside of the disposal cell(s); further historic documentation, data recovery, construction monitoring for historic resources that may be disturbed; and mitigation measures to address the permanent or temporary alteration of wetlands, waterways, and wildlife habitat (including subsurface and above ground bat habitat).
- The quantity of materials required to perform the cleanup could require about 5,000 truckloads of clean material (soil, stone, geosynthetics) to be brought to the Site. This is assuming all of the material needed for the cleanup is imported from off-site locations and on-site soil is not available for use.

- A traffic control plan would be developed and implemented to manage the truck traffic and any damage to public roads would be repaired.
- The extent of clearing and general disturbance would be approximately sixteen (16) acres.

The approximate cost of this proposed cleanup plan (Alternative 1) is $18 million. The cleanup would require 2-3 years to complete. Upon completion of the NTCRA, Post-Removal Site Control would be implemented to inspect and maintain the cover system and other engineered features. Figures 2 and 3 show the areas that will be included in the cleanup.

Alternative 2: Excavation and off-site disposal of mine waste with in-situ stabilization of select areas of mine waste.

Alternative 2 has the same components as Alternative 1 except that the mine waste material would be brought to a licensed off-site landfill rather than consolidated and capped on-site. Specific components of the Alternative 2 that are different from Alternative 1 are:

- The quantity of materials required to perform the cleanup could require 4,300 truck-loads of contaminated material to be trucked out to an off-site disposal facility and an additional 2,375 truck-loads of clean material to be trucked in to restore the disturbed areas of the Site (for a total of 6,675 truck-loads). The estimated volume of clean material to be transported to the site assumes all of the material needed for the cleanup is imported from off-site locations and on-site soil is not available for use. A traffic control plan would be developed and implemented to manage the truck traffic and any damage to public roads would be repaired.
- The extent of clearing and general disturbance would be approximately ten (10) acres.

The approximate cost of this proposed cleanup plan (Alternative 2) is $28 million. The cleanup would require 2-3 years to complete. Upon completion of the NTCRA, Post-Removal Site Control would be implemented to inspect and maintain the cover system and other engineered features. Figures 2 and 3 show the areas that will be included in the cleanup.

COMPARATIVE ANALYSIS OF THE ALTERNATIVES

A comparison of Alternative 1 with Alternative 2 and the reasons for selecting Alternative 1 are summarized below.

Alternative 1 and Alternative 2 would be equally effective in achieving the Removal Action Objectives for the Site to protect public health and the environment. They would also comply with the applicable or relevant and appropriate requirements, and they are similar with respect to the long-term effectiveness and permanence of the cleanup. Both alternatives are not inconsistent with any future final Superfund clean-up plan developed for the Site.

The excavation of the mining waste, together with either capping on-site (Alternative 1) or offsite disposal (Alternative 2) would prevent the release of MIW into Pike Hill Brook and Cookville Brook Tributary #4. The in-situ stabilization of select areas near/around sensitive bat habitat and cultural resources under both alternatives would also limit the generation of MIW from these areas.

Alternative 1 has less undesirable short-term impact because large quantities of mine waste would not be transported over public roads and the alternative would require fewer truck trips to and from the Site. Both alternatives would have unavoidable impacts to wetlands/waterways and historic resources in order to prevent the release of MIW and restore the significantly degraded aquatic

environment. While both alternatives have equal impacts to federal jurisdictional wetlands, Alternative 1 was determined to be the "Least Environmentally Damaging Practicable Alternative" (LEDPA) under the federal Clean Water Act, due to the lower short-term impacts and substantially lower cost. Both alternatives would restore impacted wetlands and waterways and implement best management practices with respect to stormwater management, sediment and erosion controls, and protection of the threatened and endangered bats.

Alternative 1 is considered to be more implementable than Alternative 2 as the off-site disposal of the mine waste is dependent upon, and thus could also be limited by, the available capacity at operating off-site landfill facilities.

Alternative 1 ($18 million) is also less expensive than Alternative 2 ($28 million).

Based on the comparative analysis summarized above and detailed in the EE/CA, EPA recommends Alternative 1 as the preferred approach for the NTCRA.

IMPACTS TO WETLANDS/WATERWAYS AND FLOODPLAINS

Section 404 of the Clean Water Act and Executive Orders 11990 (Protection of Wetlands) and 11988 (Protection of Floodplains), as incorporated under Federal Emergency Management Agency (FEMA) regulations that are relevant and appropriate to the cleanup, require a determination that there is no practical alternative to taking federal actions affecting federal jurisdictional wetlands and aquatic habitats. EPA has made the following determinations:

- The proposed cleanup will involve dredging and filling activities within on-site wetland areas and aquatic habitats.
- Site cleanup measures will be designed and implemented to minimize the destruction, loss, or degradation of these on-site wetlands and aquatic habitats and will preserve and enhance their natural and beneficial values.
- There is no federally identified floodplain within the NTCRA, and the cleanup will be conducted such that it does not pose any risk to downstream floodplain resources.

EPA is specifically requesting public comment concerning its determination that the chosen alternative is the LEDPA under the federal Clean Water Act for protecting wetland resources. Specifically, that the removal of the primary source of MIW that is significantly impairing the current wetlands and waterways will allow for the reestablishment of biota to those wetlands/waterways to be altered and then restored under the preferred alternative. While both alternatives have equal impacts to federal jurisdictional wetlands, Alternative 1 was determined to be the LEDPA due to the lower short-term impacts and substantially lower cost. Site wetland areas along with unavoidable wetland/waterway impacts on-site that are associated with Alternative 1 are shown in Figure 4.

IMPACTS TO HISTORIC RESOURCES

Section 106 of the National Historic Preservation Act of 1966, as amended (54 U.S.C. § 300101 *et seq.*), requires EPA to take into account the effects of all actions on historic properties that are eligible for the National Register of Historic Places.

- EPA, in consultation with the Vermont Division for Historic Preservation (VDHP), serving as the State Historic Preservation Office (SHPO), has determined that Pike Hill Copper Mine is eligible for the National Register of Historic Places.
- EPA has also determined that the construction activities required to implement this clean-up action would have unavoidable direct and indirect impacts on historic features at the Site, but that these impacts are necessary to protect human health and the environment.

The area potentially affected is shown on Figure 4. More detailed information on impacts to historic resources at the Site can be found in the EE/CA. EPA will take mitigation measures to address impacts to historic features.

NEXT STEPS

The EE/CA report is out for public comment for 30 days. EPA will document and respond to all public comments in a Responsiveness Summary, which will become part of the Administrative Record. Based on the comments received, EPA may modify or change the recommended alternative. EPA will then issue an Action Memorandum, with the Responsiveness Summary attached, which authorizes and initiates the removal action process. After the Action Memorandum is signed, EPA will perform a detailed design for the clean-up action and work with the community to address their concerns and provides updates regarding the details and schedule for the cleanup. The design activities could require 1-2 years to complete. After completion of the design, EPA will hire a contractor to perform the clean-up work. As a result, the actual cleanup is not likely to begin before 2024. Once a contract is awarded to perform the work, the cleanup will likely require 2-3 years of construction activities.

HISTORY OF THE PIKE HILL COPPER MINE:

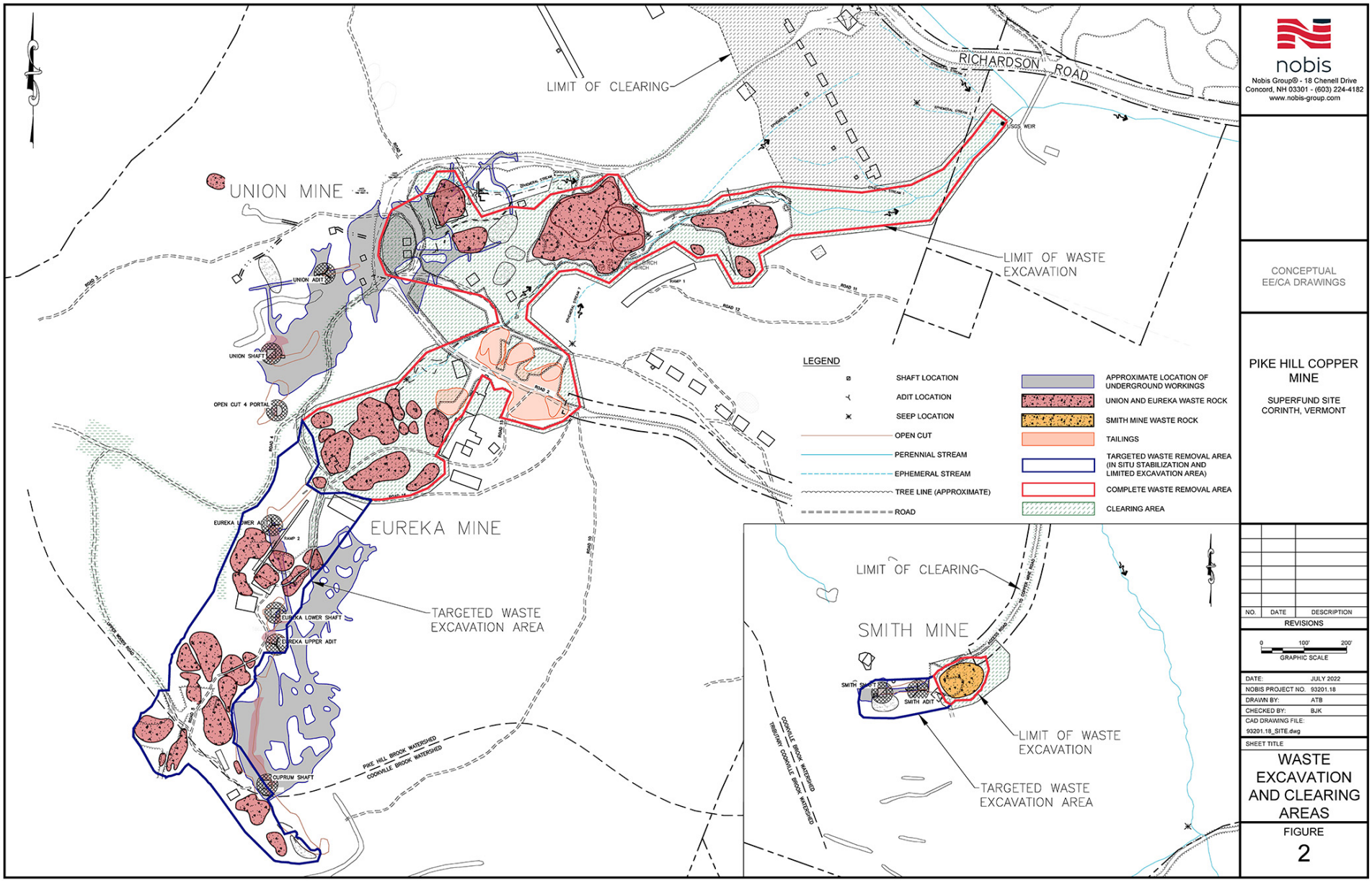
The Pike Hill Copper Mine Superfund Site consists of three abandoned copper mines (Eureka Mine, Union Mine, and Smith Mine) located in the Town of Corinth, Orange County, Vermont that were operated intermittently from 1853 until 1919. The Site was added to the EPA National Priorities List (Superfund List) in July 2004. The entire Site encompasses about 216 acres and contains approximately 85,000 cubic yards of waste rock and tailings.

Copper ore was initially discovered in the vicinity of the Smith Mine on Pike Hill in 1845. In about 1853, mining of the Eureka deposit began at the peak of Pike Hill. Underground operations at the Eureka and Union Mines began in 1863. In 1881, the known portion of the ore body at the Union Mine was exhausted. The Smith Mine closed in 1882, leaving a relatively small area of waste rock piles and underground workings. The Eureka Mine ore mill closed in 1907 and activities are poorly documented between 1907 and 1915, suggesting limited mining took place there. Operations at the Eureka and Union Mines resumed under a single company (Pike Hill Mines Company) between 1916 and 1919, when approximately 842,000 pounds of copper were produced using flotation processes with pine oil as an additive. The underground workings were never reopened, but during the late 1940s and early 1950s, portions of the ore dumps were trucked to the Elizabeth Mine mill for processing. The only remaining Site buildings were destroyed by fire in 1960. In 1954, the Site property was sold by Vermont Copper Company to Appalachian Sulphides, Inc., which subsequently sold the property to Pat Mines, Inc., in 1962. The Site is currently owned by private entities unaffiliated with the past operators.

FOR MORE INFORMATION AND COMMENT SUBMISSION

To view the EE/CA and other Site reports online please visit www.epa.gov/superfund/pikehill
Comments should be submitted via email to hathaway.ed@epa.gov or mail to:

Edward Hathaway, ME/VT/CT Superfund Section
5 Post Office Square, Suite 100, Mail Code: 07-1
Boston, MA 02109-3912



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CONCEPTUAL EE/CA DRAWINGS

PIKE HILL COPPER MINE

SUPERFUND SITE
CORINTH, VERMONT

NO.	DATE	DESCRIPTION

REVISIONS

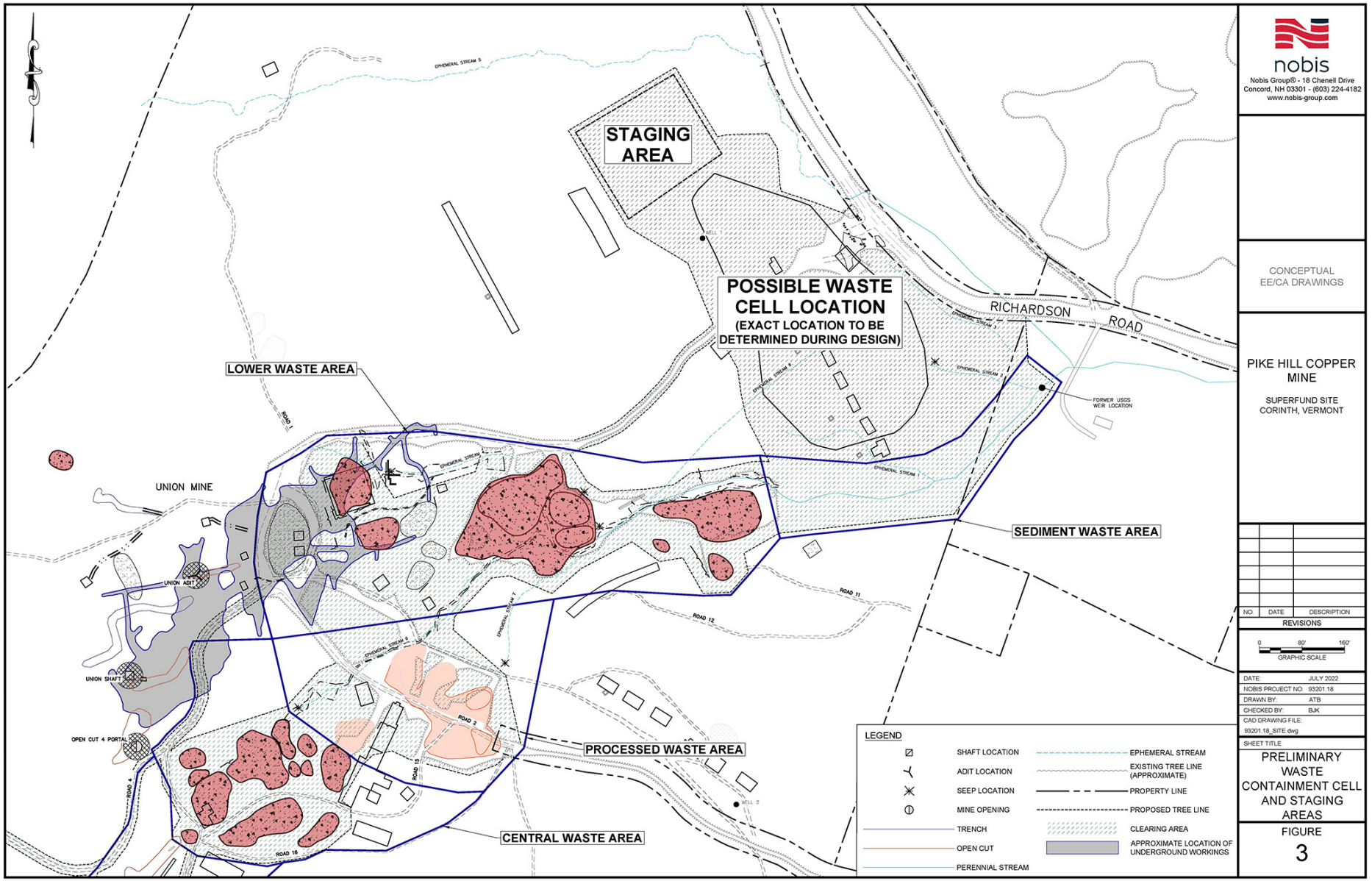
0 100' 200'
GRAPHIC SCALE

DATE:	JULY 2022
NOBIS PROJECT NO.	93201.18
DRAWN BY:	ATB
CHECKED BY:	BJK
CAD DRAWING FILE:	93201.18_SITE.dwg

SHEET TITLE

WASTE EXCAVATION AND CLEARING AREAS

FIGURE
2



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CONCEPTUAL EE/CA DRAWINGS

PIKE HILL COPPER MINE

SUPERFUND SITE
CORINTH, VERMONT

NO.	DATE	DESCRIPTION

REVISIONS

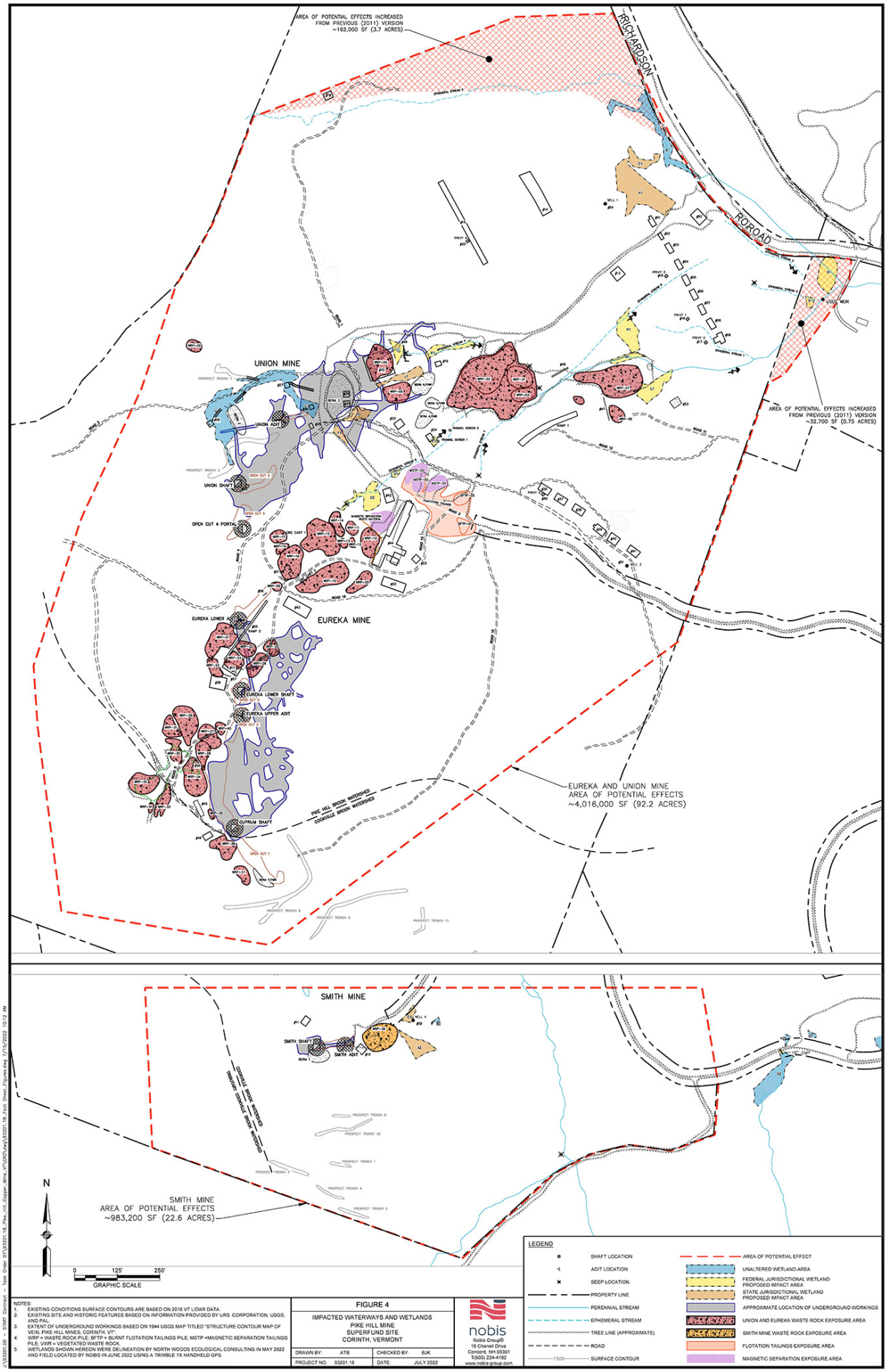
0 80' 160'
GRAPHIC SCALE

DATE:	JULY 2022
NOBIS PROJECT NO.	93201.18
DRAWN BY:	ATB
CHECKED BY:	BJK
CAD DRAWING FILE:	93201.18_SITE.dwg

SHEET TITLE

PRELIMINARY WASTE CONTAINMENT CELL AND STAGING AREAS

FIGURE
3



NOTES:
1. EXISTING CONDITIONS SURFACE CONTOURS ARE BASED ON 2016 VT LIDAR DATA.
2. EXISTING SITE AND HISTORIC FEATURES BASED ON INFORMATION PROVIDED BY URS CORPORATION, USGS, AND PAL.
3. EXTENT OF UNDERGROUND WORKINGS BASED ON 1944 USGS MAP TITLED "STRUCTURE CONTOUR MAP OF VEIN, PIKE HILL MINES, CORINTH, VT".
4. WRP = WASTE ROCK PILE; BFTP = BURNT FLOTATION TAILINGS PILE; MSTP =MAGNETIC SEPARATION TAILINGS PILE; VWR = VEGETATED WASTE ROCK.
5. WETLANDS SHOWN HEREON WERE DELINEATION BY NORTH WOODS ECOLOGICAL CONSULTING IN MAY 2022 AND FIELD LOCATED BY NOBIS IN JUNE 2022 USING A TRIMBLE TX HANDHELD GPS.

FIGURE 4

IMPACTED WATERWAYS AND WETLANDS
PIKE HILL MINE
SUPERFUND SITE
CORINTH, VERMONT

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